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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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| 09/372,351 | 08/11/99 | ADAMCHUCK V | 7024-415 |

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| EXAMINER | |
|---|---|
| GORDON, B | |
| ART UNIT | PAPER NUMBER |
| 1743 | 5 |

DATE MAILED: 04/20/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/372,351 | ADAMCHUCK ET AL. | |
| | Examiner | Art Unit | |
| | Brian R. Gordon | 1743 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 2-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 2-13 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 11 August 1999 is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

15) ☒ Notice of References Cited (PTO-892)
16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 132 on page 7, line 16; 212 on page 9, lines 4, 5, 7, and 8. Correction is required.

2. The drawings are objected to because the reference numeral 150 "shanks" of figure 4 are not shown and labeled as described on page 13 line 17. Correction is required.

### *Specification*

3. The disclosure is objected to because of the following informalities:

On page 7, line 21 the removable plate is referred to as 180 and then on page 8, first line of third paragraph the computer is also referred to as 180.

On page 7, line 15 the tow hitch is referred to as 140 and then on page 12 last line; page 13 lines 3 and 4 the probe is referred to as 140.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flamme et al. US 6,003,455 and in view of Hale et al. US 5,978,723.

Flamme discloses one embodiment of the invention that provides a system for setting, from the cab of an agricultural tractor, values of at least one operating parameter on an agricultural implement which is connected to the tractor and moved across an agricultural field by the tractor. The system includes a tractor having an operator's station; an open loop electronic control system supported by the tractor and having a set point input means and a constant value control signal generating means;

an actuator supported by the implement, connected to the control circuit, and configured to cause the steady state operating value of the parameter to be substantially equal to that of the set point; a sensor supported by the implement and configured to measure the actual value of the parameter and to communicate the measured value to the operator's station; and a display device supported by the operator's station, connected to the sensor and to the control circuit and configured to exhibit system information including at least the set point and measured value of the parameter. This embodiment of the invention enables regulation and monitoring, from within the tractor cab and while in operation, of implement operating parameters including but not limited to fluid pressures, soil engaging tool displacements and forces, and fan and pump speeds. The invention further provides a system including a closed loop, or feedback, control circuit wherein the control circuit compares a measured value of the parameter to a set point value, generates an error signal proportional to the difference, and accordingly varies a control output signal to an actuator in proportion to the error signal in order to maintain the error signal substantially equal to zero and thereby control the parameter with greater constancy, particularly when operating under nonuniform conditions. The invention further provides a plurality of pressurized agricultural product bins upon the implement, the plurality of bins being divided into at least two groups containing different products requiring different bin air pressures for best delivery to the soil. The invention still further provides a system for measurement and control of a ground opening tool engagement depth or force, selected either automatically by a GIS prescriptive map residing in memory or manually by switch, keypad, or other operator input device

located at the operator's station. The invention yet further provides a method of automatically controlling nominally regulated parameters, wherein the control circuit set point is spatially variable and is stored correlated with corresponding location data in a memory device which has been programmed with a site-specific, precision farming prescriptive map. The map may have been created using a Geographic Information System (GIS) database generated from data obtained in prior field operations, and may include longitudinal and latitudinal coordinates. The system may include antenna, receiver, and signal processing circuit to generate Global Positioning System (GPS) and Differential Global Positioning System (DGPS) locational signals corresponding to the implement's location within the field, whereby the corresponding correlated set point value may be read from memory for use in the control circuit. The device is capable of planting up to 60 rows simultaneously in a 60 foot wide swath, and may additionally and concurrently apply other products such as fertilizers, herbicides and insecticides, and pH buffers.

Referring to FIG. 1, the implement 104a includes a frame 112 connected by a tongue 118 to the tractor's 102 drawbar 116, whereby it may be traversed across a field of land. Implement 104a supports various equipment for the application of seed and other products to the soil of a field. This equipment includes, proceeding from the front of implement 104a to the rear, a hopper 134 for the storage of a granular fertilizer, a tank 144 for the storage of a liquid fertilizer, a seed hopper 136, a ground (furrow) opening tool 164, a herbicide/insecticide bin 138, a furrow closing tool 182, and a furrow pressing tool 184. While FIG. 1 shows only one of each of the above devices, it is to be

understood that row crop planting implements 104a typically plant multiple, parallel rows simultaneously. For example, implements produced by Case Corporation may include sufficient bins, hoppers, tanks, furrow opening and closing tools, etc. to plant up to 60 rows in a swath 60 feet wide. Accordingly, each planting implement 104a is typically provided with one row unit 284 (shown in greater detail in FIG. 2) for each row to be planted. As shown in FIGS. 1 and 2, a row unit 284 typically includes a furrow opening tool 164, a furrow closing tool 182, a furrow pressing tool 184, a herbicide/insecticide bin 138, a metering feeder 180, a sensor 178, an actuator 226, a motor 224, and a dispensing tube 282. Hoppers, bins, and tanks for products other than insecticides and/or herbicides are often provided in larger sizes and smaller quantities, with each hopper, bin, or tank metering and distributing product to several rows. (see entire document)

Flamme et al. does not specifically disclose the employment of a probe, sensor, or detector in order to determine the pH level of the soil samples taken from the field. Flamme is also silent to mentioning that the sensor should be cleaned or wash in between tests.

Hale et al. disclose a system that allows for spatially-variable characteristic data to be acquired during normal field operations using appropriate sensors supported by a combine, tractor or other vehicle. A variety of characteristics may be sensed including soil properties (e.g., organic matter, fertility, nutrients, moisture content, compaction, topography or altitude), crop properties (e.g., height, moisture content or yield), and farming inputs applied to the field (e.g., fertilizers, herbicides, insecticides, seeds,

cultural practices or tillage parameters and techniques used). Other spatially-variable characteristics may be manually sensed as a field is traversed (e.g., insect or weed infestation or landmarks). As these examples show, characteristics which correlate to a specific location include data related to local conditions of the field, farming inputs applied to the field, and crops harvested from the field. (column 1, lines 60 – column 2, line 8) FIG. 1 is a block diagram illustrating a site-specific farming system including vehicles equipped with sensors for sampling site-specific characteristics of a field and electronic displays for displaying visible indicia of the characteristics in the vehicle cabs, and an office or portable computer. It is disclose that one structure of the device may be used to store each layer of site-specific farming data. For example, a pH layer may include a row for each data point and columns for pH, longitude and latitude. Thus, memory card 114 may contain a layer of data for each site-specific characteristic of a field. The DPU 116 and processor 200 use correlated characteristic and location farming data to perform various functions of site-specific farming system 100. For example, DPU 116 or processor 200 use the correlated farming data to generate display signals which cause electronic display 128 or 204, respectively, to plot a map of a field which includes visible indicia of the characteristic data. DPU 116 typically plots the map in real-time as characteristic and location signals are received from the sensing circuits (e.g., flow sensor 152, moisture sensor 154, application sensors 150) and location signal generation circuit 138, respectively. However, DPU 116 may also plot a map off-line based upon farming data previously stored in memory.

It would have been obvious to one of the ordinary skill in the art to realize that if it is desirable to dispense pH buffers to a field, then one must determine the current pH levels before adding the buffers. Therefore, it would have been obvious to employ the teachings of Hale to modify the apparatus of Flamme to include a sensor or probe that allows for the testing and determination of the pH levels of the field in order to plot a map of the pH levels of that field.

As to claim 3-11, it would have been obvious to one of the ordinary skill in the art to modify the apparatus of Flamme to include a wash nozzle for the probe or sensor. It is well known in the art that in order to obtain correct readings from a probe it must be washed or clean to prevent cross-contamination of samples.

As to claims 6-11, it is obvious that the GPS system of Flamme is able to perform, calculate, and store the specific locations of the probe and sample readings. It would have also been obvious to know that when the apparatus of Flamme is employed to simultaneously cultivate 60 rows then upon the modification of the device a sensing probe assembly would be placed upon each device of each corresponding row. This would allow for the sensing of the pH level and determination of if buffers would be needed.

As to claims 12 and 13, Flamme et al. does not disclose the specific method for measuring the pH of soil, but it would have been obvious to one of the ordinary skill to modify the apparatus of Flamme by employing the teachings of Hale et al. in order to collect site-specific data to create a pH plot to the field. In the process of creating such

a plot, the method steps of claims 12 and 13 would have been obviously performed. (see entire documents of Flamme et al. and Hale et al.)

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Colburn, Jr et al disclose a soil constituent sensor.

Hale et al. ,709 disclose a panning display of GPS maps.

Hale et al. ,109 disclose global position correction.

Hale et al. ,573 disclose height control of an agricultural tool.

Hale et al. ,343 disclose an automatic scaling of GPS field maps.

Hale et al. ,618 disclose a panning display of GPS field maps.

Monson ,640 discloses a product application control with distributed process manager.

Monson ,686 discloses an intelligent mobile product application control system.

Monson ,576 discloses an animated map display method for agriculture applications.

Wendte ,169 discloses a site specific harvest statistics analyzer.

Wendte et al. ,531 disclose a crop sampling system.

Medico, Jr. et al. disclose an environmental paving material.

Saumade et al. disclose a method and apparatus for analyzing corrosive soil.

McCauley discloses system and method for deriving field boundaries. (Filing Date makes reference negligible but subject matter is pertinent)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is (703) 305-0399. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 703-308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7719 for regular communications and (703) 305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

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April 17, 2001

Jill Warden
Supervisory Patent Examiner
Technology Center 1700